

**IN THE  
UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICANTS: Joseph Vaughn Rustad et al.  
SERIAL NO.: 10/625,943  
FILING DATE: July 24, 2003  
TITLE: System and Method of Active Latency Detection for Network Applications  
EXAMINER: Frantz B. Jean  
GROUP ART UNIT: 2154  
ATTY. DKT. NO.: 16010-07269

COMMISSIONER FOR PATENTS  
P.O. BOX 1450  
ALEXANDRIA, VA 22313-1450

**DECLARATION OF FACT BY WILLIAM NOBLE UNDER 37 C.F.R. § 1.131**

I, William Noble, hereby declare the following:

1. The inventors of the invention described and claimed in United States Patent Application Serial Number 10/625,943, entitled "System and Method of Active Latency Detection for Network Applications," filed on July 24, 2003 ("the Application") cannot be located and I am authorized by Compuware Corporation ("Compuware"), the assignee of the invention, to provide this declaration of fact under 37 C.F.R. § 1.131.
2. I am providing this supplemental declaration to establish documentary proof that the invention described and claimed in the Application was conceived prior to January 31, 2003, the filing date of United States Patent Publication 2004/0153534 A1 to Gibart et al. published August 5, 2004 (hereinafter "Gibart"). The Examiner most recently cited Gibart in the Office

Action communication dated September 11, 2007.

3. I have been employed by Compuware from October 1989 to the present. My title at Compuware is Software Developer. Compuware has a place of business in Detroit, Michigan and is the assignee of the Application. I am attaching as Exhibit A, a copy of the assignment from the inventors, to Compuware as proof of ownership.


Conception

4. Attached hereto as Exhibit B comprises eight (8) pages excerpted from the Invention Disclosure Form. The Invention Disclosure Form describes basic information about the Invention. The Invention Disclosure Form was signed and prepared by one of the inventors, Joseph Rustad on September 3, 2002.

5. Accordingly, the invention described and claimed by the Application was conceived at least as of September 3, 2002, which is prior to Gibart's effective date of January 31, 2003.

I hereby declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

11/12/07  
Date

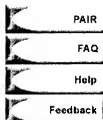
  
\_\_\_\_\_  
William Noble, Software Developer  
Compuware Corporation



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## PATENT APPLICATION INFORMATION RETRIEVAL



## Patent Assignment Abstract of Title

Total Assignments: 1

Application #: 01625943

Filing Dt: 07/24/2003

Patent #: NONE

Issue Dt:

PCT #: NONE

Publication #: NONE

Pub Dt:

Inventors: Joseph V. Rustad, Gary Kaiser, Leslie L. Murphy, Robert C. Mills, Matthew J. Snyder, George D. Lin

Title: System and method of active latency detection for network applications

Assignment: 1

Reel/Frame: 014323 / 0903

Received: 07/31/2003

Recorded: 07/24/2003

Mailed: 02/11/2004

Pages: 5

Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

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Exec Dt: 07/10/2003

MURPHY, LESLIE LAWRENCE

Exec Dt: 07/11/2003

MILLS, ROBERT C.

Exec Dt: 07/01/2003

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Exec Dt: 07/01/2003

LIN, GEORGE DA-MING

Exec Dt: 06/30/2003

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If you have any comments or questions concerning the data displayed, contact OPR/Assignments at 703-308-9723

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## EXHIBIT A

**COMPUWARE CORPORATION**  
**(Compuware)**  
**INVENTION DISCLOSURE FORM**  
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INTRODUCTORY INFORMATION

This is a form for Compuware employees and consultants to use to describe novel inventions, advancements, or developments (collectively, "Inventions") they have made. Compuware uses this form to help determine whether Compuware should seek to protect such Inventions under the patent law.

The patent law imposes certain obligations on inventors. These legal obligations were designed to ensure that protection for an invention is extended only in appropriate circumstances. The information requested on this form pertains in part to these obligations. For instance, many foreign countries will not grant patent protection for an invention that was publicly disclosed in that country before a patent application was filed. Therefore, the form seeks information on any disclosure of the Invention outside of Compuware.

This form is divided into two parts. Part One seeks basic information about your Invention. It should be filled out any time you think you may have made an Invention. The earlier you fill out Part One, the better. An Invention need only be conceived to warrant disclosure; implementation is not a prerequisite. Since you may be overly conservative in determining what constitutes an Invention, you should fill out Part One even if you aren't sure that your work is sufficiently novel, significant or valuable to be an Invention. After you complete Part One, please forward it to Linda Markman in the Legal Department.

Part Two only needs to be filled out if it is likely that Compuware will be interested in pursuing patent protection for your Invention. Typically, you will be asked by either Linda Markman, a consulting law firm, or someone else at Compuware to complete Part Two. However, you may fill out Part Two at the same time as Part One if you feel strongly that Compuware is likely to pursue a patent on your Invention. After you complete Part Two, please forward it to Linda Markman.

COMPUWARE CORPORATION  
(Compuware)  
INVENTION DISCLOSURE FORM

PART ONE

1. **Title**  
Give a descriptive title for the Invention.  
**Example:** *Parallel Processing Using Peripheral Device Microprocessors*

Determination of a computer network application's client, network, and server time from a single source using active latency detection.

2. **Application**  
What current project or projects at Compuware does the Invention relate to?

Application Vantage, Client Vantage (versions 8.6 and later)

3. **Field of the Invention.**  
Give both general and specific descriptions of the field to which the Invention relates.  
**Example:** *This invention relates generally to the field of shared processing computer systems and specifically to the field of small computer system parallel processing using idle microprocessors in peripheral devices.*

This invention relates generally to the field of computer network application performance analysis, specifically to the field of network packet capture based performance analysis.

#### **4. Background**

**Describe the problem that is to be solved by the Invention.**

**Example:** *Modern small computer systems typically consist of a personal computer and several peripheral devices. Oftentimes, the processing capability of the personal computer is insufficient for a desired processing task, even though additional unused processing power exists in the microprocessors of peripheral devices such as laser printers connected to the personal computer.*

A breakdown of a single source packet capture can typically only reveal client time and network plus server time (grouped together). This is because there is no way of knowing what times packets are received by the server, therefore the breakdown of network and server time is impossible.

#### **5. Previous Solutions**

**Describe what solutions to this problem have been tried before, and why they are inadequate. Also describe previous known solutions to similar or related problems.**

**Example:** *One existing method of increasing processing capability is for a networked personal computer to request other connected computers to help process the computer's current task. However, this scheme requires*

***a network of personal computers, assumes that other computers will have excess processing capacity to share, and suffers from slow transfer over network data paths.***

Existing solutions include using two trace files, one at the client and one at the server. This method can accurately detect the received time of packets but requires that two packet capture sources exist, one at the client and one at the server.

Another method is to use a single user supplied latency metric to estimate the time packets are received by the server. This method does not take varying latency into consideration, as is common on the internet, as well as intranets with moderate congestion.

One more method is to examine the network trace for TCP/IP connect requests, which generally have low server processing times before a reply. The round trip time can be used in lieu of a user supplied metric mentioned above. This method also has a problem with accuracy.

#### 6. Summary of the Invention

Describe in clear and simple terms how you intend to solve the problem. Attach block or schematic diagrams, timing diagrams, flow charts, or any other graphics that will make the invention easier to understand. Pay particular attention to what is unique about the invention.

**Example:** *The current invention makes use of the fact that personal computers are often connected to peripheral devices having their own microprocessors. In accordance with the invention, a personal computer identifies any attached smart peripheral, determines what processing capabilities the peripheral has, and sends data to the peripheral causing it to perform some of the data processing that would otherwise be done by the personal computer. The peripheral is essentially tricked into performing this data processing and sending back the results. The invention will be implemented entirely through software.*

The invention generates connection requests during the transaction. These requests are timed, and the latency measurements are combined to form a latency graph. The graph will be smoothed using mathematical regression analysis. Packet timing will be determined using the continuous latency measurement, and the packet timings will be used to determine client, network, and server time from a single source. There are two key differences between this method and other methods:

- 1) Packets are generated by the invention while the application is running. This is 'active' latency detection.
- 2) A continuous latency curve is realized for the entire trace, not just an average. This continuous curve is used to determine packet timings.



7. **Advantages**

How does the Invention create value, whether to an end user, an OEM, or directly to Compuware? What is the Invention's purpose and practical use?

**Example:** *Through this invention, the data processing capabilities of existing hardware can be extended by using idle peripheral device microprocessors. Customers can better justify buying a new and expensive printer if it can boost the capabilities of their existing personal computer as well.*

Through this invention, accurate breakdowns of a network application's performance can be obtained with only a single source. It also has the benefit of being 'hands free' (no user input is required).

**8. Disclosure Outside of Compuware**

Has the Invention been disclosed outside of Compuware or commercialized (e.g., offered for sale) in any way? If so, give dates and details. If not, what is the current schedule for disclosure/commercialization?

**Example:** *No disclosure outside of Compuware has yet been made, but I would like to present a paper outlining the invention at an IEEE conference in three months. Current plans are to start contacting OEM customers regarding this invention during the next quarter. The product should be in alpha test in about four months.*

No disclosure outside of Compuware has been made. This work will be in the next release (8.6) of Application Vantage and Client Vantage. This beta for this release may begin as early as December.

**9. Inventorship**

Everyone contributing to the Invention should be listed as a possible inventor. If you are not sure whether someone qualifies as an inventor, describe what that person contributed to the Invention.

Joe Rustad - initial concept and design, implementation  
Gary Kaiser - provided latency measurement method  
Les Murphy, Robb Mills, Matt Snyder - aided in design  
George Lin - implementation

Joseph Rustad  
Signature of Person  
Preparing this Form

Joseph Rustad

-----  
Name (printed) of Person  
Preparing this Form

858-824-5202  
Phone

101603  
Employee ID Number

Brian Roberts  
(Les Murphy is the project lead)  
Manager's Name

Leslie L. Murphy 9/30/02

Date Prepared: 9/3/02

Please forward this form to  
Linda Markman, Compuware Legal Department